Commonwealth of Kentucky
Division for Air Quality

DRAFT PERMIT STATEMENT OF BASIS

TITLE V PERMIT NO. V-05-088
ALCAN PRIMARY PRODUCTS CORPORATION
HENDERSON, KY
DECEMBER 16, 2005
MIN WANG, REVIEWER
AI/AFS#: 1788/021-101-00029
ACTION: APE20050001

SOURCE DESCRIPTION: Alcan Primary Products Corporation produces 299,982 tons per year of aluminum ingot. Anodes for replacement in the cells are produced from coke that is crushed, sized and mixed with pitch to form a paste. This is then formed into anode blocks that are baked. Molten aluminum produced in the cells is alloyed and homogenized in gas-fired furnaces before being cast into ingots for shipment.

BACKGROUND: On November 20, 2003, the Division issued a preliminary determination on the initial Title V permit for the primary aluminum production facility owned and operated by Alcan Primary Products Corporation in Henderson, Kentucky. However, we are re-public noticing the Title V permit of Alcan (AI#1788) since the previous proposed permit did not address company's comments. This permit also includes additional Electric Induction Furnace. The facility took Synthetic Minor Limits to avoid PSD review. The limits of actual emission of Sulfur Dioxide from three potlines and Anode Bake Furnaces are limited to not more than 5262.3 tons per year, a limitation of no more than two Electric Induction Furnaces can be operated at the same time, and process rate for electric induction furnaces not to exceed total annual process rate of 9,360 tons of cast iron production based on 12 consecutive months. This will assure that emission increase of SO_2 is less than 40 TPY.

In conclusion, this Title V issuance is considered to be initial.

COMMENTS: Emission factors are from AP-42, material balances, stack tests, and MSDS.

OPERATIONAL FLEXIBILITY: Only as allowed by the Primary and Secondary Aluminum MACTs

PERIODIC MONITORING:

A. SUBJECT ITEM 1 REQUIREMENTS: Existing Process Sources

1. Description:

Unit #	Unit Name	Material	Rate (tons /year)	Construction Date
A1 (T1-T3)	Barge Unloading	Raw Material	585,562 total	August 4, 1972

B4 (S7, S8)	Reacted Alumina Storage (2)	Reacted Alumina	140,160 each	August 4, 1972
G8 (I9)	Ingot Casting Dross Loading	Dross	5,820	August 4, 1972
M1(E9)	Anode Mix Hopper	Anode Raw Materials (No POM)	127,020	December 12, 1972
Q4 (EG)	Anode Rod Cleaning	Shot Blast Material	29,143	December 31, 1972
K1 (P1(23))	Bath Crushing/Crucible Cleaning	Anode Cover	54,137	1972
U1 (5P)	Bath Transfer to Storage Processing	Anode Cover	54,137	January 1, 1972
Q1 (EF)	Electric Arc Furnace (1)	Charge Materials	168 TPY Backup	December 31, 1972
A8 (T4)	Material Transfer	Alumina/Coke	585,562	August 4, 1972
A2 (S1, S2, S3)	Alumina Storage	Alumina	417,064 total	August 4, 1972
B6 (S4, S5)	Ore Storage	Unreacted Alumina	140,160 each	August 4, 1972
C1 (T5)	Material Transfer Rail Car	Alumina, Fluoride, Coke	193,970	August 4, 1972
C2 (T6, 2S)	Aluminum Fluoride	AlF3	3,800 Total	August 4, 1972
C4 (T7, T8, T9)	Coke Handling	Petroleum Coke	193,970 total	August 4, 1972
B6 (3S, 4S)	Coke Handling	Petroleum Coke	96,985 each	August 4, 1972
J1 (E1)	Butt Surge Tank	Anode Butts	70,000	August 4, 1972
K7 (E6)	Coke Crushing	Petroleum Coke	193,970	December 31, 1972
L1 (E7)	Coke Ball Mill	Petroleum Coke	193,970	December 31, 1972
L3 (E8)	Coke Fines Handling	Petroleum Coke	193,970	December 31, 1972
U2 (CI7)	Green Anode Dust Collector	Intermediate Coke	17,000	December 31, 1972
R2 (01) (AI)	Maintenance Area 046-Wood/Refractory Saw	Wood / Reforactory Brick	7	Dec 31, 1972
K5 (E5)	Butt Impactor	Anode Butts	70,000	December 31, 1972
J2 (E2)	Anode Butt Cleaning	Shot Blast Material	10,744	Aug 4, 1972

*Emissions from all units controlled by baghouses.

2. **Applicable Regulations:**
   401 KAR 61:020 Existing process operations.(before July 2, 1975)

3. **Compliance Requirements:**

a. To provide reasonable assurance that the particulate matter emission limitations

are being met, the permittee shall perform annual Method 5 tests on K1 and U1. Annual testing must be completed within 12 months following issuance of this permit. For all other units, the permittee shall use the formula in the compliance demonstration to determine the particulate emissions based on the hourly process weight averaged over a month. The preventative maintenance plan shall be followed for all units.

b. To provide reasonable assurance that the particulate matter emission limitations (Subject Item 1 sources except for Kl and U1) are being met, the permittee shall monitor monthly the amounts and types of process weight added to each of these emission units and follow the facility preventative maintenance (PM) plan. Excursion from the requirements of the PM plan shall be corrected in a timely manner per 410 KAR 50:055 section 1, (4).

c. To provide reasonable assurance that the visible emission limitations are being met the permittee shall:

i. Determine the opacity of emissions during operation from each stack or vent by Reference Method 9 annually, or more frequently if requested by the Division.

ii. Perform a qualitative visual observation of the opacity of emissions from each stack/vent on a monthly basis and maintain a log of the observation. The log shall note:
- Whether any air emissions (except for water vapor) were visible from the vent/stack.
- All emission points from which visible emissions occurred.

iii. Determine the opacity of emissions by Reference Method 9 if qualitative visible emissions from any stack/vent are seen.

B. SUBJECT ITEM 2 REQUIREMENTS: New Process Sources

1. Description:

Unit #	Unit Name	Material	Rate (tons /year)	Construction Date
Q2 (EF)	Electric Induction Furnaces (3) (see operating limitation)	Cast Iron	9,360	Dec 6, 1989 (No. 1 and No. 2), Jan 2006 (No. 3)
A6 (89)	Re-Melt Furnace	Aluminum	54,750	July 29, 1999
B5 (S9)	Reacted Alumina Storage	Alumina	140,160	August 4, 1979
U3 (EJ)	Central Anode Butts Cleaning	Anode Butts	80,000	December 31, 1990
B7 (S6)	Ore Storage	Unreacted Alumina	140,160	July 28, 1977
J3 (E3)	Butt Stripping/Crushing	Anode Butts	70,000	July 28, 1977
K3 (E4)	Butt Crushing	Anode Butts	70,000	June 19, 1979

E6 (EL)	Transloading Spent Potliner and Sandblasting Operations	Spent Potliner	180,136	October 1, 1995
R1 (EH)	Refractory/Carbon Saw	Carbon Blocks	16	June 19, 1979
E8 (EM)	Building (138) Vacuum System	Potliner Process Area	229	June 17, 1995
U4 (EQ1)	Anode Saw Dust Collector	Anode	120,888	2004
U5 (EO 72, 73)	Pitch Storage Tanks	Coal Tar	19,000	1977

* Emissions from all units controlled by baghouse(s).

2. **Applicable Regulations:**
401R 59:010 New process operations (on or after July 2, 1975)
40 CFR Part 63 Subpart RRR Secondary aluminum production NESHAP applies to the Re-Melt Furnace. The Re-Melt furnace is classified as a Group 2 furnace pursuant to Subpart RRR.

3. **Compliance Requirements:** To provide reasonable assurance that the visible emission limitations are being met the permittee shall:

a. Determine the opacity of emissions during operation from each stack or vent by Reference Method 9 annually, or more frequently if requested by the Division.

b. Perform a qualitative visual observation of the opacity of emissions from each stack/vent on a monthly basis and maintain a log of the observation. The log shall note:

i. Whether any air emissions (except for water vapor) were visible from the vent/stack.
ii. All emission points from which visible emissions occurred.

c. Determine the opacity of emissions by Reference Method 9 if qualitative visible emissions from any stack/vent are seen.

d. Do not operate more than two electric induction furnaces at one time. Do not exceed a total annual induction furnace process rate of 9,360 tons of cast iron production per year.

C. SUBJECT ITEM 3 REQUIREMENTS: Heat Exchangers

1. **Description:**

Unit #	Unit Name	Fuel	Rate (MMBTU /hour)	Construction Date
S5 (EI)	Indirect Heat Exchanger – (Electrode Boiler)	Natural Gas	12.5	December 31, 1972
S6 (EI)	Indirect Heat Exchanger	Natural Gas	12.5	December 31, 1972

2. **Applicable Regulations:**
401 KAR 59:015 New indirect heat exchangers (on or after April 9, 1972)
40 CFR 63 Subpart DDDDD – National Emission Standards for Hazardous Air

Pollutants for Industrial/Commercial/Institutional Boilers and Process Heaters

3. **Compliance Requirements:** While burning natural gas unit is considered in compliance with opacity standard and no testing, monitoring, or recordkeeping is required.

D. SUBJECT ITEM 4 REQUIREMENTS: Potlines (3)

1. Description:

Unit #	Unit Name	Control	Construction Date
E1 (P2, P3, P4, P5)	Potline 1	Dry scrubber/baghouse for reactors, pot hood (roof monitor) for potroom.	August 1972
E3 (P6, P7, P8, P9)	Potline 2		August 1972
E5 (1P, 2P, 3P, 4P)	Potline 3		August 1979

2. Applicable Regulations:

401 KAR 61:165 Existing primary aluminum reduction plants
40 CFR 63 Subpart LL Primary Aluminum Production NESHAP

3. Compliance Requirements:

a. Pursuant to 40 CFR 63.847:

i. The TF emissions from each potline shall be monitored through quarterly performance tests using the procedures outlined in 40 CFR 63 (63.847(d)(1)), TF emissions from potlines.
ii. For TF emissions for each potline, the permittee shall compute and record the monthly average from at least three runs for secondary emissions and the previous 12-month average of all runs for the primary control system to determine compliance with the applicable emission limit. OR
iii. The TF emissions can be measured from one potline and other similar potlines can be monitored by alternative procedures provided the permittee demonstrates that the potlines are similar.

b. While operating under an approved implementation plan, the owner or operator shall monitor the operating parameters of each control system, keep records, and submit periodic reports as required for each source subject to this subpart.

c. The permittee shall install, operate, and maintain a monitoring device to determine the daily weight of aluminum produced.

d. The permittee shall visually inspect the exhaust stacks of each control device on a daily basis for evidence of any visible emissions indicating abnormal operation.

e. If a monitoring device for a primary control device measures an operating parameter outside the limits established pursuant to 40 CFR 63.847 (h) or if visible emissions indicating abnormal operation are observed from the exhaust stack of a control device during daily inspections, the permittee shall initiate the

corrective action procedures identified in the startup, shutdown, and malfunction plan within 1 hour. Failure to initiate the corrective action procedures within 1 hour or to take the necessary corrective actions to remedy the problem is a violation.

f. The permittee shall install, operate, and maintain ambient air monitoring equipment for fluorides at sites as specified by the Division if requested.

g. Sulfur Dioxide Emissions: Annual sulfur dioxide (SO2) emissions shall not exceed 5,262.3 total tons per year from the production of primary aluminum by electrolysis (potlines) and anode bake furnace operations.
Compliance Demonstration: Compliance with the annual SO2 emission limit shall be determined by computing the total primary aluminum production SO2 emissions monthly using the Alcan SO2 Calculation Engine and calculating a rolling 12-month SO2 emission total for the primary aluminum process (potlines and anode baking furnaces).

E. SUBJECT ITEM 5 REQUIREMENTS: Green Anode Production

1. Description:

Unit #	Unit Name	Rate (tons/year)	Construction Date
M2 (1E)	Anode Mix Conveying	127,020	December 12, 1972
M3 (2E)	Anode Mix Conveying	127,020	January 1, 1975
M4 (3E)	Anode Mix Conveying	127,020	June 19, 1979
M5 (6E, 7E, 8E)[2, 3]	Anode Mixers (3)	54,437	August 4, 1972
M6 (9E,EA)[2, 3]	Anode Mixers (2)	36,291	July 28, 1977
M7 (5E,4E)[2, 3]	Anode Mixers (2)	36,291	August 4, 1972

Emissions from Process units M2 thru M7 are controlled by a baghouse and dry coke scrubber (Unit # EN);

[2] Units M5, M6, and M7 include a common pitch scale not listed as a separate unit
[3] Units M5, M6, and M7 prepare materials for two existing Presses Press 1 and Press 2

2. Applicable Regulations:

401 KAR 61:020 Existing Process Operations for Unit M2, M3, M5 and M7
401 KAR 59:010 New Process Operations for Unit M4 and M6
40 CFR 63 Subpart LL Primary Aluminum Production NESHAP

3. Compliance Requirements:

a. To provide reasonable assurance that the dry coke scrubber is operating correctly, the coke and air flow rates shall be monitored.

b. The permittee shall specify and provide the basis or rationale for selecting parameters to be monitored and the associated operating limits for the emission

control device.

c. The permittee shall visually inspect the exhaust stacks of each control device on a daily basis for evidence of any visible emissions indicating abnormal operation.

d. If a monitoring device for a primary control device measures an operating parameter outside the limits established pursuant to 40 CFR 63.847 (h) or if visible emissions indicating abnormal operation are observed from the exhaust stack of a control device during daily inspections, the permittee shall initiate the corrective action procedures identified in the startup, shutdown, and malfunction plan within 1 hour.

e. Failure to initiate the corrective action procedures within 1 hour or to take the necessary corrective actions to remedy the problem is a violation.

f. To provide reasonable assurance that the particulate matter emission limitations are being met, the permittee shall monitor monthly the amounts and types of process weight added to the paste production process and follow the preventive maintenance plan.

g. To provide reasonable assurance that the visible emission limitations are being met the permittee shall:

i. Determine the opacity of emissions during operation from each stack or vent by Reference Method 9 annually, or more frequently if requested by the Division.

ii. Perform a qualitative visual observation of the opacity of emissions from each stack/vent on a monthly basis and maintain a log of the observation. The log shall note:

- Whether any air emissions (except for water vapor) were visible from the vent/stack.
- All emission points from which visible emissions occurred.
- Whether the visible emissions were normal for the process.

iii. Determine the opacity of emissions by Reference Method 9 if qualitative visible emissions from any stack/vent are seen.

F. SUBJECT ITEM 6 REQUIREMENTS: Anode Bake Furnaces

1. Description:

N2 (EE) Anode Bake Furnaces (2)
Description: Processing rate 120,888 tons per year baked anodes.
Fuel Usage: 450 mm scf per year natural gas usage per furnace.
Control equipment: Baghouse/dry scrubber
Construction date: June 19, 1979

2. Applicable Regulations:

401 KAR 59:010 New Process Operations
40 CFR 63 Subpart LL Primary Aluminum Production NESHAP

3. Compliance Requirements:

To avoid PSD, annual sulfur dioxide (SO2) emissions shall not exceed 5,262.3 total tons per year from the production of primary aluminum by electrolysis (potlines) and anode bake furnace operations.

Compliance Demonstration: Compliance with the annual SO2 emission limit shall be determined by computing the total primary aluminum production SO2 emissions monthly using the Alcan SO2 Calculation Engine and calculating a rolling 12-month SO2 emission total for the primary aluminum process (potlines and anode baking furnaces).

a. Pursuant to 40 CFR 63.847, the TF and POM emissions from each anode bake furnace shall be monitored through annual performance tests using the procedures outlined in 40 CFR 63 (63.847 and 63.849), TF and POM emissions from anode bake furnaces.

b. For each anode bake furnace, the permittee shall measure and record the emission rate of TF and POM exiting the outlet of the primary control system for each anode bake furnace and compute and record the annual average (minimum of three runs per year) for the primary control device. All valid runs must be included in the averages.

c. To provide reasonable assurance that the total fluoride emission limitations are being met, the permittee shall determine upper and/or lower operating limits, as appropriate for each monitoring device for the emission control system from the values recorded during each of the runs from the initial performance test and from historical data.

d. While operating under an approved implementation plan, the owner or operator shall monitor the operating parameters of each control system, keep records, and submit periodic reports as required for each source subject to this subpart.

e. The permittee shall install, operate, and maintain a monitoring device to determine the daily weight of green anode material introduced into the furnace.

f. The permittee shall visually inspect the exhaust stacks of each control device on a daily basis for evidence of any visible emissions indicating abnormal operation.

g. If a monitoring device for a primary control device measures an operating parameter outside the limits established pursuant to 40 CFR 63.847 (h) or if visible emissions indicating abnormal operation are observed from the exhaust stack of a control device during daily inspections, the permittee shall initiate the corrective action procedures identified in the startup, shutdown, and malfunction plan within 1 hour.

h. Failure to initiate the corrective action procedures within 1 hour or to take the necessary corrective actions to remedy the problem is a violation.

i. To provide reasonable assurance that the particulate matter emission limitations are being met, the permittee shall monitor monthly the amounts and types of process weight added to the anode bake furnaces (as green anodes) and follow the facility preventative maintenance (PM) plan (see attachment).

j. To provide reasonable assurance that the visible emission limitations are being met the permittee shall:

i. Determine the opacity of emissions during operation from each stack or vent by Reference Method 9 annually, or more frequently if requested by the Division.

ii. Perform a qualitative visual observation of the opacity of emissions from each stack/vent on a daily basis and maintain a log of the observation. The log shall note:

a. Whether any air emissions (except for water vapor) were visible from the vent/stack.

b. All emission points from which visible emissions occurred.

iii. Determine the opacity of emissions by Reference Method 9 if qualitative visible emissions from any stack/vent are seen.

G. SUBJECT ITEM 7 REQUIREMENTS: Holding & Re-Melt Furnaces

1. Description:

Unit #	Unit Name	Control	Construction Date
F1 (I1-I6)	Holding Furnaces (6) with In-Line Degassers	None	August 4, 1972
F2 (I7, I8)	Holding Furnaces (2) with In-Line Degassers	None	August 4, 1979

2. Applicable Regulations

401 KAR 59:010 New process operations for unit F2
401 KAR 61:020 Existing process operations for unit F1
40 CFR Part 63 Subpart RRR Secondary aluminum production NESHAP

3. Compliance Requirements:

a. The permittee shall perform monitoring pursuant to 40 CFR 63 Subpart RRR, section 63.1510, Monitoring and compliance provisions.

b. To provide reasonable assurance that the visible emission limitations are being met the permittee shall:

i. Determine the opacity of emissions during operation from each stack or vent by Reference Method 9 annually, or more frequently if requested by the Division.

ii. Perform a qualitative visual observation of the opacity of emissions from each stack/vent on a monthly basis and maintain a log of the observation. The log shall note:

c. Whether any air emissions (except for water vapor) were visible from the vent/stack.

d. All emission points from which visible emissions occurred.

e. Whether the visible emissions were normal for the process.

iii. Determine the opacity of emissions by Reference Method 9 if qualitative visible emissions from any stack/vent are seen.

H. SUBJECT ITEM 8 REQUIREMENTS: Roads

1. Description:

EP (EP) Unpaved Roads
Control equipment: None
Construction date: 1972

2. Applicable Regulations
401 KAR 63:010 Fugitive emissions

3. Compliance Requirements: The permittee shall monitor the time, date, and type of precaution taken to prevent particulate matter from becoming airborne.

I. SUBJECT ITEM 9 REQUIREMENTS: Natural Gas Usage

1. Description:

Unit #	Unit Name	Rate	Units	Construction Date
A7 (90)	Re-Melt Furnace	64	MMBTU/hr	August 1, 1999
H1 (1I)	Homogenizing Furnace	13.5	MMBTU/hr	March 1990
H2 (2I)	Homogenizing Furnace	13.5	MMBTU/hr	March 1990
H3 (3I)	Homogenizing Furnace	13.5	MMBTU/hr	March 1990
H4 (I31)	Homogenizing Furnace	14.0	MMBTU/hr	December 29, 2000

2. Applicable Regulations: 401KAR 59:010: New process operations

3. Compliance Requirements: The permittee shall monitor source-wide throughput of fuel, and only natural gas shall be used as fuel for all furnaces.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.